

THE INSTITUTE SPOKESMAN



PUBLISHED BY THE
NATIONAL LUBRICATING GREASE INSTITUTE

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New Advertisers—

In last month's issue of "The Spokesman" the Pure Oil Company of Chicago joined the steadily increasing group of "Spokesman" advertisers with a half page ad, the first of many that are to follow. The Pure Oil Company is well-represented in the N.L.G.I. activities with Mr. W. G. Clark serving on its Board of Directors and as a member of the Finance Committee and New Activities Committee. Mr. H. L. Moir is the Vice Chairman of the N.L.G.I. Technical Committee along with Mr. Clark and Mr. M. B. Chittick, the latter serving at N.L.G.I. liaison with the Society of Automotive Engineers, the American Standards Association, and N.L.G.I. representative with the American Society of Testing Materials.

The other "new" advertiser is really not new at all in that the Swan-Finch Oil Corporation has used a one-sixth page space in "The Institute Spokesman" for a number of years. However, they are entitled to special recognition and a cordial welcome in this column because the May and future issues of "The Spokesman" carry a half page ad for the Swan-Finch Oil Corporation which is the new size of their space and "The Institute Spokesman" readers will be seeing the Swan-Finch sales message in a space triple its former size.

In this issue we call our readers' attention to the one-sixth page ad on page ten of the Lincoln Engineering Company of St. Louis. Recently having joined the N.L.G.I. as an Associate Member (Page 7, April, 1947, issue) we now have the added pleasure of welcoming them as a new advertiser in "The Spokesman."

To these new advertisers, a cordial and genuine welcome to the columns of "The Spokesman."

H. K. Stahl Company Celebrates Sixtieth Anniversary

On page 13 of this issue of "The Institute Spokesman" a half page ad announces the diamond anniversary of the H. K. Stahl Company in St. Paul. In 1887 Mr. H. K. Stahl started a grease manufacturing plant. The progress was steady and the reputation grew until the claim of the organization as "The Grease Spot of the Northwest" (its early slogan) was well-established.

In 1919 Mr. William H. Jacobson and associates purchased the controlling in-

The INSTITUTE SPOKESMAN

Published monthly by

THE NATIONAL LUBRICATING GREASE INSTITUTE

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4638 Millcreek Parkway
Kansas City 2, Mo.

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terest of the company and built it to nearly its present size. At his death in 1939 his son, A. E. "Lon," accepted the Presidency and management of the company which has continued to grow and expand even during Mr. Jacobson's absence for forty months serving in the Pacific as a Lt. Com. of the United States Navy during World War II.

"The Institute Spokesman" adds its congratulations and good wishes to the H. K. Stahl Company on the passing of this important milestone and with added pleasure welcomes the company as a new advertiser in the columns of the "Spokesman."

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CHICAGO

N. L. G. I. Founder and First President Dies

J. R. Battenfeld, 58, one of the Founders and the first President of the National Lubricating Grease Institute died in St. Luke's Hospital in Kansas City, Missouri, Wednesday, May 7th, 1947, after a six months illness. Mr. Battenfeld was President of the Battenfeld Grease and Oil Corporation, of Kansas City.

Following a major operation at the Mayo Clinic, Rochester, last January, Mr. Battenfeld spent several months at his La Jolla, California, home returning to Kansas City in April. His final illness was of short duration being in the hospital only four days before his death.

A native of Galion, Ohio, Mr. Battenfeld was educated in the Cleveland public schools and started in the lubricating grease and oil business forty years ago as a clerk with the Stevens Grease and Oil Company of Cleveland. Mr. Battenfeld's business career was one of the success stories that are so characteristic and so fine a part of American life. Starting literally on a shoe-string, he built an important unit of his industry. Coming to Kansas City in 1912 as the western representative of the Stevens Grease and Oil Company he decided to enter business for himself. With a capital of \$600.00 he started the Battenfeld Grease and Oil Corporation which is now one of the larger manufacturers of lubricating grease in this country.

Mr. Battenfeld's interest in the industry was evident of the fact that he was a charter member and a Past President of the Oil Men's Club of Kansas City, a member of the American Petroleum Institute and the Society of Automotive Engineers. He was one of the Founders and the first President of the National Lubricating Grease Institute serving as a member of the Board of Directors and Chairman of its Membership Committee at the time of his death. He gave liberally of his time, advice, and counsel, to the affairs of the Institute and kept a keen and never-lagging interest in its activities.

Mr. Battenfeld was equally outstanding as a civic leader having served as President of the Board of Education, the Boy's Club, the Rotary Club, Jackson

Continued on page 15

"BAT'S AC TRAC-ROLL"

*A Lubricating Grease for use in the Truck Wheels-Support Rollers-
and Truck Idlers of Allis-Chalmers H D Series Track Type Tractors*

**FULLY APPROVED by the TRACTOR DIVISION of the ALLIS-CHALMERS
MANUFACTURING COMPANY**

For more than a year our customers have reported excellent service
from BAT'S AC TRAC-ROLL

BATTENFELD GREASE & OIL CORPORATION

KANSAS CITY, MO.

NORTH TONAWANDA, N. Y.

MINNEAPOLIS, MINN.

"Business Is Ingreasing"

MODERN TRENDS IN THE APPLICATION OF LUBRICATING GREASES

About the Author

Mr. Kraus, a native of Chicago became associated with Alemite in 1923, after attending Northwestern University and Armour Institute of Technology. In his new post, he will direct the factory field force of sales engineers responsible for distribution and jobber contact in the automotive, industrial, farm, aviation, marine, and other fields. For several years prior to assuming his new post, Mr. Kraus has headed the S-W Industrial Sales Division. He is a member of the American Association of Lubrication Engineers.

Gentlemen, when I last had the honor of speaking before you at your National Convention held in New Orleans in 1942, little did any of us realize what was ahead. Even in our wildest imagination we couldn't foresee the production miracle that was to take place as America was turned into what was later referred to as "The Arsenal of Democracy." We could not foresee the many ingenious and almost human machines that were to make their appearance, and the hundreds upon hundreds of new industrial plants that were to be built, not only in the cities, but in the corn fields of America. We did not realize that much of the productive equipment in these plants, representing investments of billions of dollars, would in many instances have to be manned and maintained by inexperienced personnel. Men and women from every walk of life—salesmen, grocery clerks, and waitresses, for example, who had no mechanical knowledge or experience whatsoever, had to be relied upon to do the job.

With industry working around the clock, irreplaceable machinery was taking a terrific beating because production schedules had to be met. Management placed new emphasis on all phases of preventive maintenance and the Lubrication Department assumed its rightful position of importance alongside other vital maintenance departments.

In many plants the position of Lubrication Engineer was elevated to new importance, and in still additional thousands of plants the job of Lubrication Engineer was newly created. This group

By CHAS. I. KRAUS, ALEMITE DIVISION OF STEWART-WARNER CORPORATION



Mr. Chas. I. Kraus, who delivered this paper before the 14th Annual N.L.G.I. Convention in Chicago, October 1st, 1946.

of men actually won their spurs through their fine record of accomplishment during those trying production years. This occupation has been given a real lift, and it appears to be headed toward still greater prominence. With the cooperation of the Petroleum Industry, the place of the Lubrication Engineer will continue to grow in importance, and this, obviously, will prove beneficial to all of us associated with the Petroleum Industry.

It is a matter of record that your industry made many noteworthy advances during the war years. All of you can justifiably gain real satisfaction in the realization that the successful operation of every plane, tank, vehicle, farm machine, and industrial machine, was actually dependent upon the unfailing performance of your products.

It should be recognized that careless handling or improper application of lubricants can easily nullify the excellence of your products no matter how good they may be. All too frequently bearing failures are attributed to the recommendations of your engineers, or to the product

itself, when the real trouble may be due to the unsuitability of the grease for use in the equipment available for its application, or to inexpert, careless handling. As the variety of greases continues to expand, and the scope of mechanical devices for their handling and application broadens, there is increased reason for producers and marketers of petroleum products and manufacturers of lubricating devices to work closer together. It is encouraging to know that representatives of these groups are meeting together as a committee during this Convention to discuss their problems and exchange their ideas. This action will prove beneficial to each of us engaged in the industry.

Just as the supervision of lubrication has improved through the greater recognition of the Lubrication Engineer, and petroleum products have improved to keep pace with mechanical improvements, so too, has there been heartening progress in the improvement of lubricating devices. In this discussion of "Modern Trends in the Application of Lubricating Greases" I will show you some interesting examples of this progress.

Figure 1



The matter of keeping grease free from contamination is one which cannot be over-emphasized. While your industry goes to great extremes in the processing, packaging, and shipping of your petroleum products to insure cleanliness, it seems at least a little inconsistent that more is not done to remind your users of the importance of keeping the product clean during storage, handling, and application. Some reminder, such as this, in some prominent place on the drum might help in some measure to improve this condition.

Now, about handling grease—

On this slide you see an oiler loading a hand gun with grease by use of a paddle. Figure 1. This condition may exist in industry today due to negligence on our part to mention the better method of doing the job. There are a number of good mechanical devices available for loading guns without mess, waste, or danger of contamination. One new development is the combination loader and volume pump shown here.



Figure 2

This is a 35 pound capacity, high pressure grease pump equipped with hose and coupler which may be used for lubricating conveniently accessible fittings. Also, notice the bracket on the side of the pump. This holds the hand gun which may be used, when necessary, to reach fittings located high above the floor level or at inaccessible places. This combination unit has another desirable feature. It incorporates a new type gun loading valve. As you see here, by simply placing the gun on the loader fitting, and then pumping the handle of the

pump a few strokes, the hand gun is loaded. There is no mess, waste, or chance for contamination of the lubricant, and the problem of air pockets in the hand gun is completely eliminated.



Figures 3 and 4

The loader valves are now being built into new type hand guns as shown in Figure 1. The loader valve is placed on the loader fitting of a suitable pump and the gun is easily and quickly filled. There is no need for taking the gun apart, so this factor alone helps to prevent contamination of the lubricant.

A further step in the orderly handling of lubricants is represented by this newly developed complete portable lubrication department which is coming into general usage by industry. Figure 5.

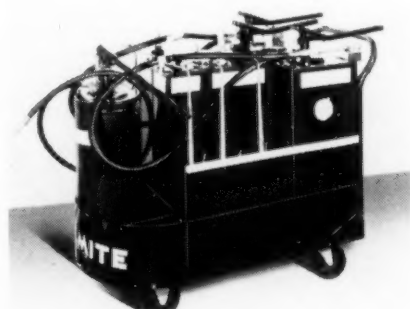


Figure 5

This type of equipment adds new importance to the oiler's job. It is a well known fact that in many instances the tools make the job. Poor tools most generally produce unsatisfactory work, good tools produce good work.

Many modern plants cover vast areas and require a large variety of petroleum products. In such instances, a complete lubrication department on wheels, like the unit you see here, will contribute much to the over-all planning and effective operation of the lubrication departments. This unit had adequate capacity and provision for carrying a supply of five types

of oils or greases with suitable storage space for auxiliary equipment such as hand guns, oil cans, waste rags, adapters, etc.

Figure 6 shows a portable lubrication unit equipped with an electric power operated high pressure pump. This pump

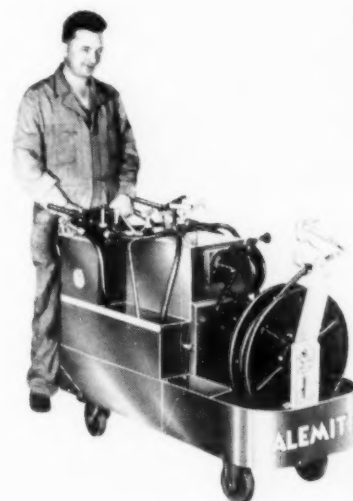


Figure 6

is equipped with air automatic reel to accommodate the lubricant hose and control valve. Power lubrication is made available by simply plugging the electric cord into any convenient electric socket.

Still another way of conveying lubrication throughout the plant is by means of stationary power lubricating equipment and pipe lines. As you see here in Figure 7.



Figure 7

Lubricant or oil may be supplied directly from the original sealed containers by means of a power pump. Electric or air powered lubricant pump may be used to deliver either lubricant or oils through pipe lines to central oiling stations throughout the plant. And by this method, petroleum products may be made available for refilling auxiliary equipment at convenient locations through the plant, or the supply may be used for delivering lubrication di-

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President's Column...

PROGRESS IN THE GREASE INDUSTRY



H. P. Hobart, President
N.I.G.I.

The word "grease," coming from the early Latin *Crassus*, meaning fat, has been used rather loosely to describe practically all kinds of fatty and oily substances. Even today it is frequently applied to lubricants that

are more or less solid at room temperature regardless of their composition, or to any lubricant sold by the pound.

The American Society For Testing Materials defines petroleum greases as "a semi-solid or solid combination of a petroleum product and a soap or a mixture of soaps, with or without fillers, suitable for certain types of lubrication."

Unfortunately, the literature on the development of the grease industry is so meager that it is not possible to present a detailed historical account of grease

making. This is largely due to the secrecy which surrounded the activities of the early grease makers and the limited number of technical articles which they published.

Grease, as a mixture of soap and mineral oil, is thought to have been made for the first time shortly after Colonel Drake's discovery of petroleum at Titusville, Penn., in 1859. The first plant for the commercial manufacture of petroleum grease is reported to have been built at Pittsburgh, Penn., in 1885.

Grease manufacture, long regarded as an art, was formerly carried on in an atmosphere of secrecy by grease makers who, with little or limited chemical background, made their compounds in old-fashioned kettles by "rule of thumb" or "trial and error" methods. In spite of these unscientific methods, many of them turned out remarkably satisfactory products which met the requirements of the day. The grease making art was frequently passed from father to son and several years were usually required for an apprentice to learn to make the simpler greases. A much longer period of apprenticeship was required to develop a finished grease maker.

Most machinery of the 19th century involving comparatively low speeds and temperatures, could be lubricated satisfactorily with a few simple greases, but with the advent of the automobile, modern high speed industrial machinery, and the development of aircraft, a need has arisen for a variety of greases to take care of higher speeds, greater bearing pressures, and higher temperatures. The grease trade, thus called upon to supply a steadily increasing quantity of products with special properties, has expanded into a full-fledged industry. Modern scientific mixing equipment with complete motions for thorough stirring, temperature controls, improved weighing and measuring devices, were introduced.

The early greases consisted principally of Cold-Sett Lime Greases, such as the older types of "Axle Grease," and Cooked Lime Greases, such as the more common types of "Cup Greases."

Later developments included the high melting point sodium greases, aluminum soap greases, high consistency special block greases for paper mills, cement mill trunion bearings, railway driving journal bearings, special greases for automobile wheel bearings, universal joints, water pump and chassis fittings, in which

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various characteristics including melting point, resistance to oxidation, solubility in water, pumpability in dispensing equipment, etc., have been emphasized by special ingredients and special compounding.

The base oils now used in grease making cover practically the entire range of lubricating oils from light spindle oils to heavy residuums, including bright stocks and cylinder stocks.

In addition to the lime, sodium and aluminum soap bases originally used, lead soaps, lithium soaps, barium soaps and strontium soaps, are now used as well as many mixed soap bases, each imparting special characteristics not otherwise readily obtainable to an equal degree.

Anhydrous greases employing calcium base soaps and having unusually high melting points are now available, as are special low torque greases, special synthetic greases and special low temperature greases for operating temperatures down to 80° below zero Fahrenheit.

Various chemical additives for improving different characteristics are now playing an important part in grease manufacture. These include anti-foam agents, anti-rust compounds, anti-wear agents, color stabilizers, corrosion inhibitors, extreme pressure agents, metal deactivators, oiliness additives, oxidation inhibitors, polymerization inhibitors, tackiness agents, torque depressers, etc.

Today, grease manufacturing processes are controlled largely from the chemical laboratory although the judgment and the experience of the grease maker are still important factors. With modern grease making equipment it is possible to produce batch after batch of grease with uniform characteristics, once the correct ingredients have been determined upon and the proper routine established.

Some of the most recent developments in the grease industry include continuous processes for grease manufacture involving a high degree of automatic

control and greatly increased production per kettle.

As evidence of the rapid expansion and increasing importance of the American lubricating grease industry following World War I, the U.S. Census Bureau reports that in 1919 there were 95 grease manufacturers in the United States who produced in that year, approximately 282,200,000 lbs. of grease valued at \$17,015,000. In 1939, there were about 350 grease manufacturers who in that year produced approximately 642,101,000 lbs. of grease valued at \$30,725,000. Similar Government statistics are not yet available on the grease industry since 1939 for later years.

A good share of today's research by manufacturers of petroleum products is going into grease development. American lubricating grease manufacturers are today continuously developing new greases with improved oxidation stability, non-separating characteristics, better resistance to washing from metal surfaces by water, higher melting points, together with low yield points, higher film strength, and increased oiliness or lubricity. The grease industry is ever ready to meet any new requirements for lubricating grease for any new designs of auto-

Continued on page 15

Special Delivery to Every Bearing!

Farval—the Dualine System with the Positive Piston Displacement Valve — that has but 2 Moving Parts—is Fully Adjustable—and with a Tell-tale at each bearing to show the job is done.

THE FARVAL CORPORATION
CLEVELAND 4, OHIO

FARVAL

CENTRALIZED SYSTEMS OF LUBRICATION



A Complete Line of Quality Oils and Greases



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Sweetwater, Tex.

MODERN TRENDS IN THE APPLICATION OF LUBRICATING GREASES

Continued from page 5

rectly to bearings or gears on individual machines.

Ranking in importance with cleanliness is a matter of proper identification of lubricants.

In many instances, after careful selection of the highest quality petroleum products for very specialized jobs, lubricants are literally thrown together in the oil room with very little identification to give the oiler a lead as to the purpose for which they are intended. As a matter of fact, during the war this problem became so serious that WPB and the National Machine Tool Builders Association petitioned the American Standards Association to appoint a committee to formulate a color identification code for industrial lubricants. This committee consisted of representatives of the petroleum industry, manufacturing industries, lubricating equipment manufacturers, and Army and Navy personnel. Some of you gentlemen served on this

committee, and many of you are familiar with War Standard Code Z-47 that was the outgrowth of this committee's work.

We are all aware of the fact that usually a wide variety of lubricants are required to handle the exacting requirements of any industrial plant, but have we ever stopped to think of this condition from the oiler's standpoint? As indicated by Figure 8.

You can realize that "with 57 varieties of lubricants which are hard to identify" the oiler's job can easily result in confusion. A logical answer to this problem, and a solution being adopted by industrial plants in increasing number is—to color route all lubricating oils and greases from-barrel-to-bearing. Figure 9.

Let's take a look at a color identification program under actual operating conditions. Figure 10. Identification quite naturally must begin in the oil room with



Figure 8

each container and piece of lubricating equipment properly identified to indicate the use for which it is intended. Proper identification at this point will prevent the possibility of oils and greases getting mixed in transferring them to hand guns, oil cans, etc. This is the first step toward the prevention of misapplication of lubricants.

The next step is to place suitable color identification on all lubrication points to guide the oiler. Figure 11. The color of the symbol will tell the oiler what kind of oil or grease is to be used. The shape of the color symbol will tell the oiler how



SYMBOL of America's oldest
oil company, manufacturers of
specialized lubricants since 1853.

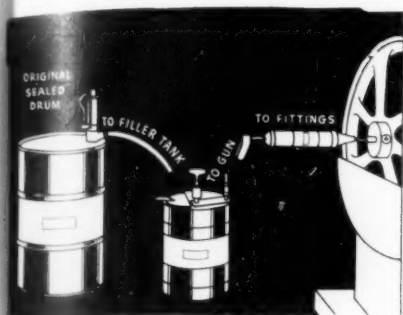


Figure 9

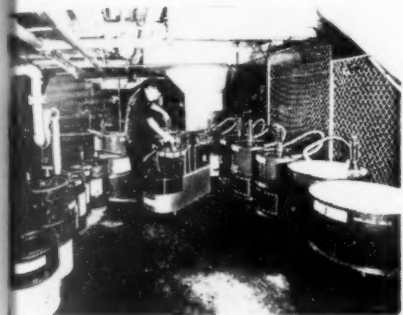


Figure 10

frequently lubrication should be applied. One of the principal advantages of any color identification program is that color symbols may be used to high-light and

point out inaccessible or hidden lubrication points which otherwise could be easily overlooked. For example, the red triangle symbol shown here tells the oiler that there is a lubrication point hidden from view behind the inspection door on this machine.

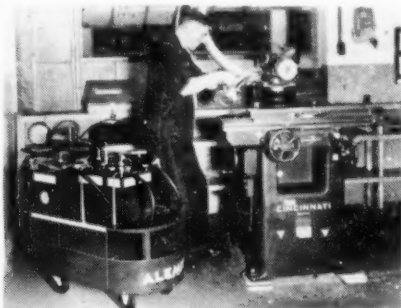


Figure 11

Here you see the oiler applying a pressure gun lubricant to a high pressure fitting on a lathe.

Here the oiler is servicing the gear case on another industrial machine. He simply matches the blue color symbol on the machine with the lubricant supply marked blue; or the green color with the supply marked green, and so on. With proper color identification it's really hard for the oiler to make a mistake.

What I have mentioned to this point may be termed the logistics of lubrication because it concerned problems in handling and applying petroleum products.



Figure 12

Now, let's look at another phase of lubrication . . . CENTRALIZED LUBRICATION. Here is a method of lubrication that offers many outstanding advantages to industry. Namely, more positive lubrication, the elimination of down-time for lubrication, and a significant contribution to plant safety. The adaptation of Centralized Lubrication is now rapidly expanding to practical use on light as well as heavy-duty machinery. Perhaps the best evidence of the pronounced trend

in this direction is reflected in a post-war survey conducted by Steel Magazine.

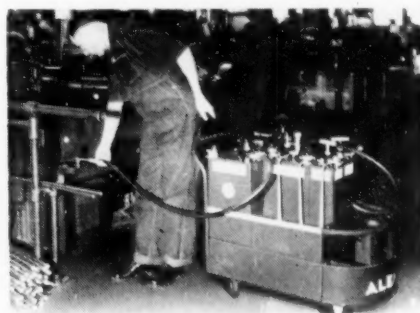


Figure 13

When the editors of "Steel" asked 2,358 industrial plants to state what features they wanted in their post-war machine tools, 85.6% replied that they wanted Centralized Lubrication on their new machine tools.

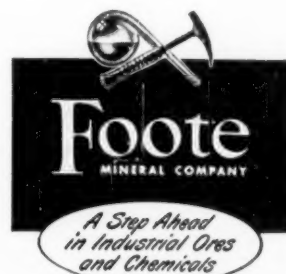
Centralized Lubrication on many machine tools is so well established that the principal questions now are the extent to which it should be used and the systems to be employed. Careful specification of lubricant for these systems also is highly important. Although the average of 85.6 per cent for all plants

Quality BUYERS
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LITHIUM—The original multi-purpose grease component now available at prices permitting high quality grease manufacture at competitive costs.

wanting Centralized Lubrication is high, the figure for plants with over 500 workers is still higher at nearly 94 per cent.

In the face of present day conditions, it is only natural that industry is widely attracted to devices such as these. Most Centralized Systems are relatively inexpensive and the economics that accrue as a result of production savings generally pay the cost of the system within a few months time, and then continue to earn additional profits.

In general, Centralized Systems for grease lubrication fall into one of the following classifications:

Figure 14 illustrates a typical application of the
"SINGLE LINE TERMINATING SYSTEM"

Lubro-Meter

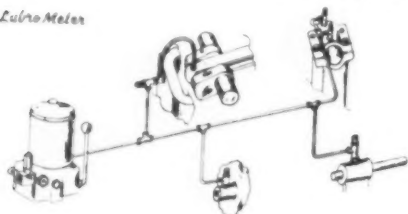


Figure 14

Individual valves, connected to a single lubricant supply line, automatically provide each bearing with a predetermined quantity of lubricant when the lubricant pump at the system inlet is operated. After all the valves in the system have discharged, an indicator rises signaling the operator that the job is finished. Valves, wherever possible, screw directly into the bearings. This feature, plus the single main supply line running to a dead end, makes this system both easy to install and extremely versatile in application. System handles either oil or grease over a wide range of operating temperatures. The system may be serviced by hand or power guns, either portable or stationary.

"MULTIPLE LINE SYSTEM"

Progressive

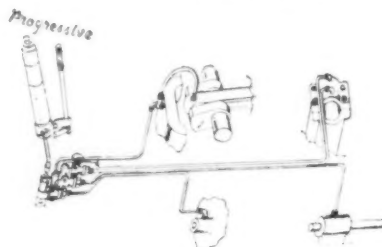


Figure 15

This system (Figure 15) consists of a block of valves which accommodate for different sizes of pistons, the selection of which is based on the amount of lubricant required by the bearings. Individual tubing lines connect each valve outlet to the bearing being served. Lubricant is applied with a portable grease gun, actuating each valve in the block in progressive order, then causing a signal to rise indicating to the operator that lubricant has been discharged by each valve through the line to the bearing. A block of valves consists of from three to a maximum of twenty outlets. This system is designed especially for use with light and medium bodied grease at normal operating temperatures of plus 50° to 100° F.

"SINGLE LINE CIRCUIT SYSTEM"

Dual Progressive

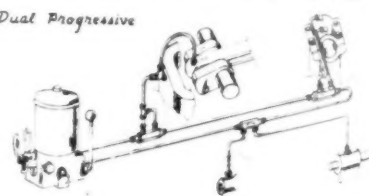


Figure 16

Continuous, closed process revolutionizes Wax production



AT Continental Oil Company's Ponca City plant, these four VOTATOR units deliver a continuous flow of paraffin wax at the rate of more than 40,000 pounds per eight-hour day. This is double the volume formerly achieved with roll-type equipment occupying about the same floor space, and the job is done with half the manpower formerly required. One man serves two VOTATOR units.

Completely closed, clean, automatic—VOTATOR apparatus turns out and packages uniformly crystallized wax at the critical temperature of 116° F.

Achieving a high overall coefficient of heat transfer, the continuous, closed VOTATOR process is equally successful with lubricating grease and other viscous petroleum products. Write to The Girdler Corporation, VOTATOR DIVISION, Louisville 1, Kentucky.

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Votator

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Each feeder valve of this system has dual outlets, each outlet being connected to a bearing by means of tubing. A special valve is used at the inlet for reversing the flow of lubricant through the circuit. Lubricant is introduced into the system (at the reversing valve) and progressively operates each feeder valve in the circuit in one direction (serving one-half the total number of bearings), and then returns to the reversing valve where an indicator rises. The operator then moves the handle of the reversing valve to the opposite position, and pumps lubricant through the circuit in the reverse direction until the indicator again rises, delivering a measured amount of lubricant to the other half of the bearings in the circuit. This system is completely enclosed and handles either oil or grease. Valves are fully hydraulic in operation.

"DUAL LINE TERMINATING SYSTEM"

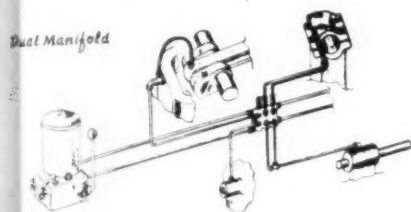


Figure 17

This system (Figure 17) consists of a central pumping mechanism, control valve and indicator, manifold feeder (adjustable), and dual lubricant supply lines terminating at the last valve block. When lubricant is pumped into the system the valves operate in one direction, lubricating one-half the bearings in the system, the firing order depending upon the resistance of the bearings. When all the valves have operated, an indicator rises. The operator then moves the handle of the control valve to the opposite position and pumps lubricant through the other line (actuating the valves on the return stroke) until the indicator again rises, delivering lubricant to the other half of the bearings in the system. The feeder valve blocks are available with two, six, eight and ten outlets, each outlet being connected to a bearing by means of tubing. Valves are fully hydraulic in operation, and will handle all types of oil and grease over a wide temperature range. This is a heavy duty system particularly adapted for heavy equipment, or for batteries of heavy machines to be lubricated from one central point.

One outstanding factor which accounts for the wide acceptance of Centralized Lubrication is the recent design of new compact types of systems which readily appeal to many new avenues of industry.

As you can see from Figure 18 this new type of Centralized Lubrication feeder valves (the one in the center) compares most favorably in size, with the common pressure gun fittings used on all types of machinery. The availability of these midget feeder valves has made it possible for many manufacturers to adopt



Figure 18

Centralized Lubrication to a wider variety of machines. A typical example of how this midget feeder valve may be adapted to smaller machinery is shown in Figure 19.

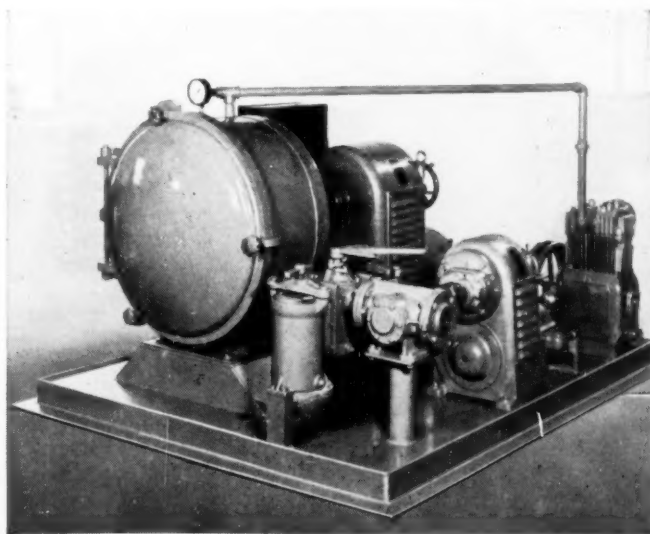
This is a Centrifugal Extractor, a common type of laundry machine, equipped with a Centralized Lubrication System. Centralized Lubrication for machines of this type may have previously been looked upon as an expensive luxury. But now, with the availability of new inexpensive midget type valves, Centralized Lubrication can be adopted at a nominal additional cost. Note that a regular lever type hand gun has been conveniently mounted on the side of this machine as

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Grease Homogenizer, showing feed pumps, strainers and vacuum pump.

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an integral part of the built-in lubrication system. Figure 20.



Figure 19

With this installation, all bearings in the system receive an accurately measured amount of lubricant at each lubrication period, and the job is accomplished by simply operating the handle of the gun for a few strokes.



Figure 20

In Figure 21 you see the system as it is installed on the underside of the bed plate of the machine. A single line system sup-

plies lubricant to each of these inaccessible bearings.

Where cleanliness is all important, as in textile mills, or food plants such as you see in Figure 22.

The advantages of Centralized are looked upon most favorably. In Figure 23

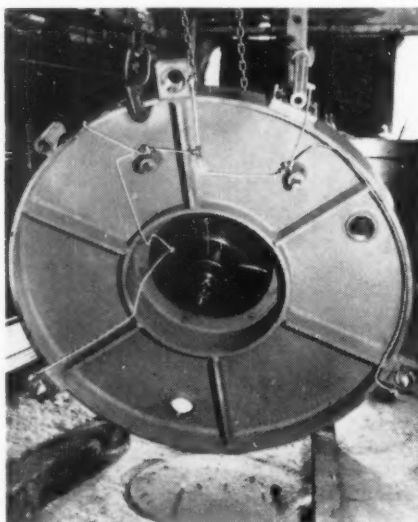


Figure 21

you see a single line circuit system installed on an Automatic Labeler, a machine that applies labels to bottles containing a food product. In this case, while cleanliness was the most obvious advantage offered, one of the principal reasons for the adoption of the system was that, previously, an oiler had lost part of a finger

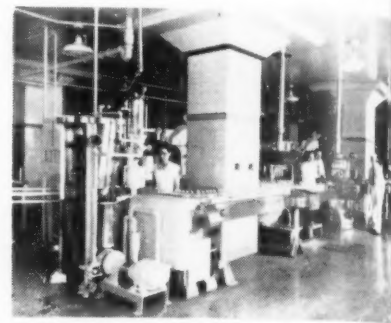


Figure 22

lubricating the machine by manual methods, while the machine was in motion. This plant now estimates a saving of \$1,819 per year in lubrication cost per machine. With ten production lines in operation, the savings would amount to \$18,190 per year.

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Overhead cranes are ideal subjects for Centralized Lubrication. The principal advantage to be gained from Centralized

Lubrication on overhead cranes is—added safety for the oiler or maintenance personnel. All dangerously located lubrication points may be piped to a single convenient location so that the hazards to the workman are almost completely eliminated. Here you see a typical application of a single line terminating system installed on one of eighty-four overhead cranes in a steel mill. Management of this mill reported that Centralized Lubrication reduced "down-time" for lubrication from one and one-half hours to just ten minutes per crane.

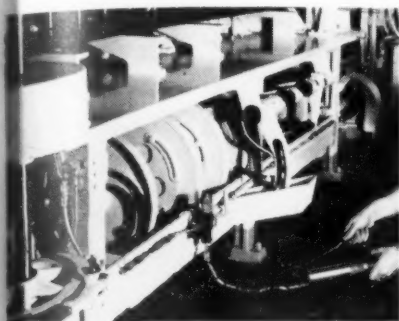


Figure 23

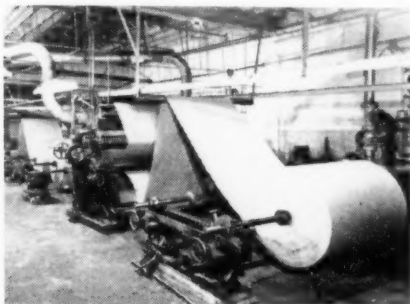


Figure 25

In passing let me say that the advantages of Centralized Lubrication are not confined to new machines. For example, here is a case where a manu-

facturer wanted to add years of life to a production unit, which admittedly had been overworked due to the unprecedented demand for his product. This is a processing unit (Figure 26) that turns out corrugated paper. The machine is approximately 200 feet long, and it contains 720 individual grease lubricated bearings, some of which are comparatively inaccessible, or completely hidden from sight. Lubrication by conventional hand gun methods required many hours time, and many bearings could not be serviced while the machine was in operation.



Figure 26

On this installation a lubricant supply line was installed overhead throughout the full length of the 200 foot machine.

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Lubricant was delivered through the pipe line by means of the air operated pump shown in Figure 26. The 720 bearings were equipped with feeder valves and connected to six central lubrication points along the length of the machine. Each of the six control points is connected to the main supply line overhead. In this manner, by simply opening and then closing the three-way valve at each of the six control points, the 720 bearings are accurately and safely lubricated in a matter of minutes . . . and the job is done while the machine continues to produce.

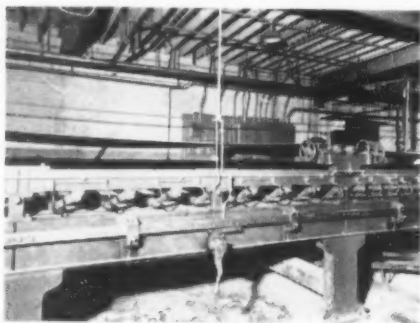


Figure 27

Figure 27 shows a close up of the system installed on the paper rollers. Note that many of the bearings are connected to the feeder valves by flexible hose in order to compensate for the oscillating motion of the roller assemblies.

As previously mentioned, the operator simply turns the valve and positive lubrication is applied to a group of 100 or more bearings.

Figure 28 is a Centralized grease lubrication system installed on a conveyor,

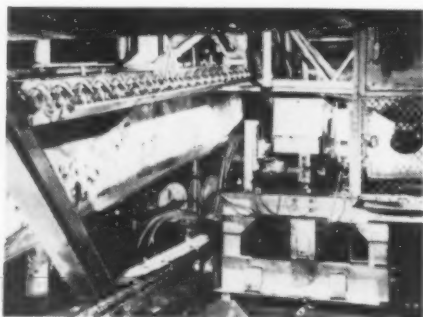


Figure 28

which is used for transporting white hot steel billets after they are removed from a rotary hearth furnace. This application completely eliminated "shut-downs" for lubrication.

Figure 29 is a multiple line system application in the same steel mill. This system serves many inaccessible bearings

located underneath the rotary hearth furnace.

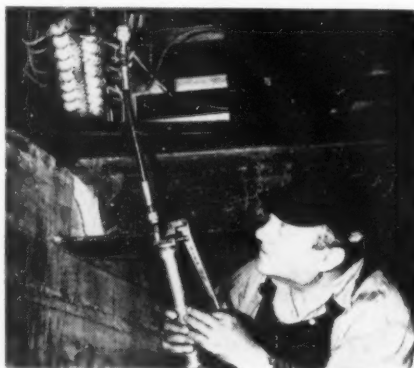


Figure 29

There is a definite trend in industry to Centralized Lubrication in complete departments, or for groups or batteries of machines. Figure 30 you see a drawing of a press room equipped with overhead pipe lines that carry lubrication to a complete battery of presses. Note that the lubrication requirements of all presses are served from one central hand operated grease pump. Incidentally, any one of the presses can be removed from the lubrication system whenever it may be so desired.

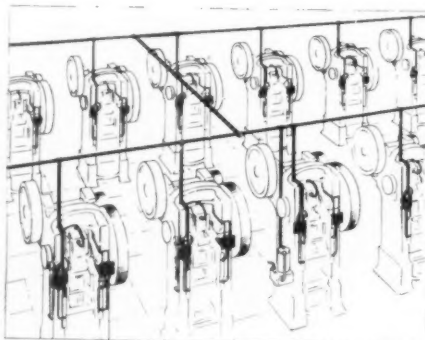


Figure 30

Fully automatic Centralized Lubrication, which has been in use for some

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time in the steel industry, is now likewise being adopted more generally by other industries. This is a significant trend toward the elimination of the human element wherever practical. One modern development along this line is shown



Figure 31

here—this is an automatic lubrication control unit. It controls the frequency of lubrication at predetermined time intervals ranging from every minute, two minutes, 15 minutes, half-hour, etc.,

Continued on page 16

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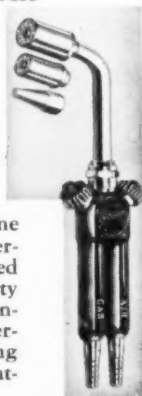
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N.L.G.I. Founder and First President Dies

Continued from page 3

County Society of Crippled Children, Boy Scouts of America, Goodwill Industries. He was a member of the Kansas City Club, Ararat Shrine, Royal Order of Jesters, Mission Hills Country Club, and a charter member and elder of the Country Club Christian Church.

Mr. and Mrs. Battenfeld previously suffered the loss of their two sons; the younger one in 1939 during his undergraduate days at Kansas University and the older son in 1945 in a Naval plane crash while serving the United States Navy as a Flight Combat Surgeon. Their brave response was the gift of Battenfeld Hall to Kansas University, a dormitory for deserving young men. They also established two scholarships at Kansas University. Two students studying under these scholarships sang and played the organ at Mr. Battenfeld's funeral.

The flags over the public schools of Kansas City were flown at half mast for two days in tribute to Mr. Battenfeld and this statement is taken from an editorial in the "Kansas City Star":

"Mr. Battenfeld took the obligations of citizenship seriously. A dozen worthy movements enlisted his aid over the years. This modest, cheerful man had a great gift for friendship, people instinctively liked and trusted him. His untimely death brings a keen sense of loss to a multitude of individuals as well as the community as a whole."

In the Country Club Christian Church sanctuary, filled to capacity with saddened friends and facing two stained glass windows given to the church and dedicated just the Sunday before in memory of both of their parents, his pastor said:

"Jess Battenfeld was first and foremost a public-spirited citizen, who poured his talents into every phase of the life of his city. He was a material success, but this large congregation would not have gathered to do him honor if his accomplishment had been in the business world alone. He was a vigorous untiring worker for the common good. Although he and Mrs. Battenfeld lost their two sons their devotion to the young men and women of this community was in no ways dimmed."

The lubricating grease industry as well as the Institute has lost one of its truly great leaders who will be sadly missed.

President's Column . . .

Continued from page 7

motive, aviation, industrial or military requirements.

Grease manufacturers, producing approximately 90% of the present production of lubricating greases, are members of the National Lubricating Grease Institute, founded in 1933. This organization is active in cooperating with industry and government in developing test procedures for the purpose of maintaining consistently high quality and uniform greases for the benefit of the grease consumer. The N.L.G.I. system of classifying lubricating greases by consistency numbers has been widely adopted and it represents, without a doubt, the most important step taken by the industry in standardization benefiting both the consumer and the supplier.

During the emergency period of World War II, American lubricating grease manufacturers cooperated wholeheartedly with the Government in developing special greases for war equipment on land, sea, and in the air. The special products developed by them contributed in no small way to giving this country the best war material of any nation.

American ingenuity promises to keep the grease industry abreast of our future mechanical progress.

N.L.G.I. Board of Directors Meeting

At 10:00 a.m. on Monday, April 28th, 1947, at "The Homestead," Hot Springs, Virginia, the Board of Directors of the N.L.G.I. met and gave consideration to an agenda of thirty-three items. Among the important decisions taken by the Board at this meeting was the enthusiastic approval of the changes and improvements in "The Institute Spokesman" itself, the raising of the advertising rates, and the establishment of a subscription price of \$2.00 per year. The program for the Fifteenth Annual N.L.G.I. Convention scheduled for the Edgewater Beach Hotel, Chicago, Illinois, October 16-18th, 1947 was reviewed and the revised Constitution and By-Laws previously approved by all Active Members of the Institute was adopted. The next Board of Directors meeting is scheduled for the Hershey Hotel, Hershey, Pennsylvania, June the 16th, 1947.

to once every twenty-four hours. This unit may be adopted to a single machine or a battery of machines which are on the same lubrication time schedule. Notice the red and green signal lights. Obviously the green light shows when the system is under pressure and functioning properly. If the drum becomes empty, or if for any reason the line pressure in the system drops, the red light serves as a warning signal that the system is inoperative.

Without discussing the mechanics of operation, I can tell you that its operation is comparable to the alarm clock that wakes you up in the morning. The automatic timer is set to function at the desired interval and its operation is automatically controlled from that point on. This unit is used in conjunction with an air or electric operated lubricant pump. At the prescribed time the automatic control turns on the power pump, permitting the flow of lubricant to all bearings served by the system. After the lubrication cycle has been completed, the timer shuts off the pump and it remains shut off until the next prescribed lubrication period.

There is a pronounced trend in the Construction Industry toward power lubrication methods. Prior to the war portable lubrication units were beginning to take their place as a vital part of construction equipment for a more or less select group of contractors who had considerable modern equipment of all kinds. The war added impetus to the adoption of portable lubrication departments to the extent that they are now looked upon as a vital piece of construction equipment just as essential to many contractors as their mixers, shovels, or tractors. Portable Service Stations were adopted by contractors in the Armed Forces in large numbers and their practicability was proven during the war years.

Figures 32 and 33 are some typical examples of units used by private contractors. Such units provide many services including high pressure lubrication, gear lubrication, crankcase lubrication, air and

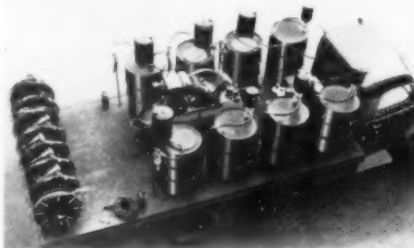


Figure 32

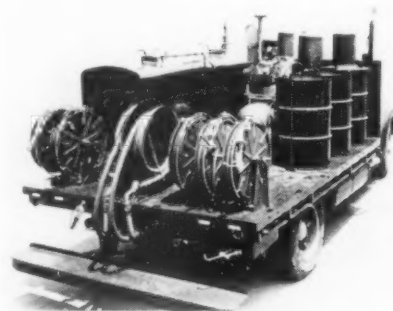


Figure 33

water supply, and in many instances units carry a supply of fuel, oil, gasoline, etc. The principal advantages of portable lubrication units in the construction field are that time study figures reveal that the use of power lubrication saves up to 50 percent of the time formerly required to do the job by hand. Furthermore, the power units supply additional lubricant pressure and adequate volume so important in this industry because of the need for flushing bearings of dirt, grit and moisture.

The idea of portable lubrication departments has spread to coal mine operations primarily because the same lubrication



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problem exist in that industry as in the construction industry. Rugged mining equipment is subjected to the damaging effects of abrasive coal dust, and therefore, lubrication methods constitute one of the greatest maintenance problems of the industry. A typical portable lubrication department used in the mining industry is shown in Figure 34.

This mine locomotive has been equipped as a complete portable lubrication department.

Here you see a view of the electrically operated air compressor which supplies the power for operating the lubrication pumps. Figure 35.

This view shows the installation of the high pressure lubricant pump and a low pressure pump which may be used for

handling fluid oils or hydraulic oils.

The idea of portable lubrication departments has won acceptance in farm

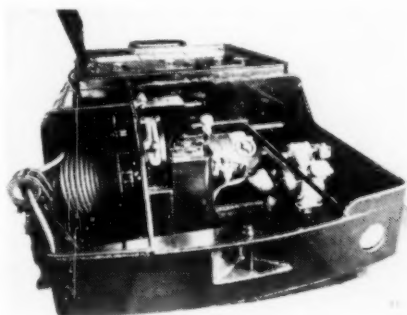


Figure 34

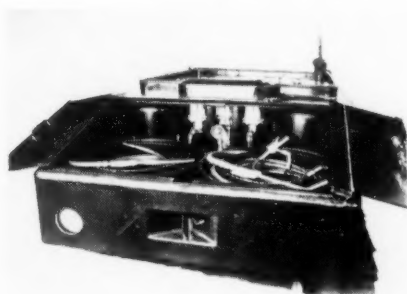


Figure 35

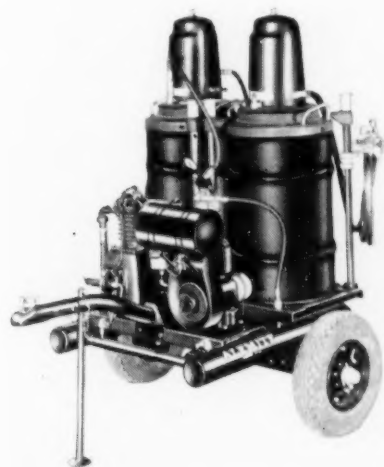


Figure 36

field. With the universal adoption of power farming, power lubrication on the farm has been widely accepted. A typical farm portable lubrication unit is shown here. Figure 36.

Continued in July Issue

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MANUFACTURERS AND EXPORTERS OF LUBRICANTS

FATS AND FATTY ACIDS FOR LUBRICATING GREASE MANUFACTURE

By C. W. Georgi and J. B. Stucker

Continued from May Issue, 1947

Lithium Soap Greases

Lithium soap greases are made very similarly to aluminum base lubricants except higher temperatures, in the order of 400° F., are required to dissolve or disperse the lithium soap in the mineral oil.⁴ Saturated, high titre acids are used almost exclusively in preparing lithium soaps, stearic acid and hydrogenated fish oil acids being preferred.⁵

Lithium soaps are prepared either by the double decomposition method or by direct reaction of lithium hydroxide with the selected fatty acid. The latter method of preparation is becoming more general because of the lower manufacturing expense.

The use of lithium soap greases has been restricted to rather specialized applications, such as aircraft lubricants and greases for extreme low temperature service, due to the high cost of lithium. However, the very high melting point and good water resistance properties of lithium base greases offers advantages over calcium, aluminum and soda base greases, which may well lead to expanding usage.

Barium Soap Greases

Barium soap greases are made quite similarly to sodium base lubricants, although the processing is more complex.⁶ As with lithium greases, barium base lubricants involve higher costs of raw materials and manufacture, but their combined properties of high melting point and good water resistance may well lead to expanding use.

Future Trends in Lubricating Greases

Lubricating greases are a relatively young class of lubricants and it is only a matter of 20 or 30 years from the days of simple axle greases to today's tremendous variety of grease lubricants,

each specifically formulated and processed to do a particular type of lubricating job.

Over this period of time, grease lubricants have expanded from an insignificant and unimportant part in the petroleum lubricants field, to the point they are now a material and indispensable factor. At the same time, grease manufacture has developed from a secret and sometimes mysterious art to an increasingly exact science capable of precise physical and chemical control from raw materials to finished lubricants.

Grease lubricants are primarily used in those applications where oils are unsatisfactory because of seepage and leakage. Because greases possess the characteristics of better adherence and resistance to seepage or leakage, they are also becoming increasingly preferred to

oils in many applications wherein frequent replenishing is necessary when is used, but where such relubrication is inefficient or impractical. Greases are accordingly finding increased applications where performance for long periods without attention for shut-downs and relubrication is desired.

The future trends in grease lubrication may accordingly be summarized as:

- (1) Increasing importance in the overall field of lubrication.
- (2) Development of improved greases having combined properties of high melting points, good water resistance and exceptional stability for long service under severe conditions of load, temperature and environment.
- (3) Improved methods of production including continuous rather than batch manufacture, mechanical homogenization and dispersion, etc.
- (4) Emphasis on the purity, composition and stability of the fatty and fatty acids utilized in making the metal soap bases.

With further respect to the fatty materials used in lubricating greases, it

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4—U.S. Patent Reissue 22,299, April 13, 1943.
C. E. Earle.

5—"The Effect of Fatty Acid Molecular Weight on Lithium Greases."
The Institute Spokesman, Vol. X, No. 4, July, 1946.

6—U.S. Patents 2,033,148 (March 10, 1936) and 2,114,383 (April 11, 1939).
T. F. Ott and P. S. Clarke.

well known that trace impurities of iron, copper, nickel and lead in fats or fatty acids will act as active oxidation catalysts in greases exposed to elevated temperatures. Since oxidation stability of grease lubricants is receiving much attention, increased interest in fats containing minimums of catalytic impurities is indicated.

Because of the emphasis on temperature stable and oxidation resistant greases, much attention is also being given to oxidation inhibitors and similar additives. Study of the natural inhibitors present in many natural fats and development of improved or stabilized fats is accordingly

of much interest to grease manufacturers.

Lastly, grease chemists are paying considerable attention to metallic soaps prepared from substantially single component fats or fat acids, instead of the heterogeneous mixtures existing in natural fats. There thus seems to be a fertile field for cultivation in fats and acids of more uniform and definite composition than the natural fats and roughly fractioned constituents therefrom.

The grease industry will certainly be interested in developments and improvements in fat technology along the lines mentioned, and will welcome the cooper-

ation of fat processors in the constant effort to produce better lubricants.

Acknowledgment

The authors wish to acknowledge the cooperation and assistance of the following members of the National Lubricating Grease Institute Technical Committee in the preparation of this paper:

H. L. Moir and	Pure Oil Company
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N. J. Gothard	Socony-Vacuum Oil Co.
T. G. Roehner	Standard Oil Co. (Ind.)
L. C. Brunstrum	The Texas Company
Gus Kaufman	

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